

### REMARKS

The Final Office Action and the Advisory Action have been carefully considered. This is an Amendment filed under 37 C.F.R. 1.114 with a Request for Continued Examination (RCE). Reconsideration and allowance of the application and all presently pending claims are respectfully requested.

Upon entry of the claim amendments in this Response, claims 1-7, 9-27, 29, and 53-110 are pending in this application. Claims 1-3, 9, 11, 12, 14, 15, 53-59, 60-64, 74, 78, 79, 81, 84, 86, and 87 have been amended, and claims 97-110 are newly added. The prior art made of record has been considered, but is not believed to affect the patentability of the presently pending claims. Applicants believe that no new matter has been added and that a new search is not necessary.

### CLAIMS

#### Claims 1 and 53-58

Claims 1 and 53-58 are rejected under 35 U.S.C. §102(e) as purportedly being anticipated by Chee *et al.* (U.S. Patent 6,544,732). Claim 1 reads as follows:

1. A structure, comprising:

*a first structure disposed within a second structure, wherein the first structure is nonporous, wherein the first structure has a diameter from about 1 to 20 nanometers, wherein the first structure includes a nanospecies having a first characteristic and a second detectable characteristic, wherein a second detectable energy is produced corresponding to the second detectable characteristic upon exposure to a first energy; and*

*wherein the second structure includes a porous material having the first characteristic and a plurality of pores, wherein the first characteristic of the nanospecies and the first characteristic of the porous material are the same, where the interaction of the first characteristic of the nanospecies with the first characteristic of the porous material cause the nanospecies to interact with the porous material and become disposed in the pores of the porous material, and wherein the first characteristic is*



selected from a hydrophobic characteristic, a hydrophilic characteristic, an electrostatic characteristic, and combinations thereof.

(Emphasis added). Applicants traverse the rejection noted above and submit that the rejection of claim 1 under 35 U.S.C. §102 (e) in view of Chee, should be withdrawn because Chee does not disclose, teach, or suggest, at least, the highlighted portions in amended claim 1 above. Chee does not teach that the “first structure is nonporous”. The Advisory Action states that “the microspheres and the nanocrystals [of Chee] are the same entity”. Chee states that the microspheres maybe porous (col. 8, line 10) and that the nanocrystals are embedded in the pores of the beads (col. 15, lines 35-38). Therefore, the microspheres of Chee are porous, in contrast to the first structure presented in claim 1, which is recited to be non-porous.

In addition, Chee does not teach that “the first structure has a diameter from about 1 to 20 nanometers” as recited in claim 1. Chee teaches microstructures that are greater than 100 nanometers (Col. 8, lines 12-15), which is in contrast to the first structure presented in claim 1.

Further, the first structure recited in claim 1 includes a nanospecies that has a first characteristic and a second detectable characteristic. The Advisory Action states that the microsphere and nanocrystal of Chee “collectively comprise the first and second characteristics...”. As argued above, the first structure is nonporous and has a diameter from about 1 to 20 nanometers, while Chee teaches a microsphere that is porous and has a diameter greater than 100 nanometers. Therefore, the microsphere and nanocrystal “entity” of Chee as defined in the Advisory Action cannot be properly used to anticipate the first structure of claim 1. The entity of Chee does not meet at least the features relating to non-porous, diameter, and having a first characteristic and a second characteristic, all recited in claim 1.



Thus, Chee does not disclose, teach, or suggest, at least the features highlighted above in claim

1. Applicants respectfully request that the rejection to claim 1 should be withdrawn.

In addition, the rejection of amended claims 53-58 should be withdrawn for the same reasons as claim 1.

**Claims 2-7, 9-27, 29, and 97-98**

Applicants respectfully submit that pending dependent claims 2-7, 9-27, 29, and 97-98 include every feature of independent claim 1 and that Chee fails to disclose, teach, or suggest at least the features of claim 1 highlighted hereinabove. Thus, pending dependent claims 2-7, 9-27, 29, and 97-98 are also allowable over the prior art of record. *In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988).

In addition to the arguments discussed above for claim 98, the following describes additional reasons why claim 98 is allowable over the cited references. Chee does not disclose, teach, or suggest that “each pore is configured to include a plurality of non-discretely positioned nanospecies”, as recited in claim 98. Chee requires that the substrate “contain discrete individual sites” for the beads (Col. 5, lines 54-56). In addition, Chee states that substrate can be modified to allow attachment of “microspheres at individual sites” (Col. 6, lines 50-52). Finally, Chee states that “the surface of the substrate may be modified such that discrete sites are formed that can only have a single associated bead...” (Col. 6, lines 53-55). In conclusion, Chee states that each pore includes a single microsphere in contrast to claim 98. Therefore, for at least this reason also, claim 98 is allowable over the cited reference.



**Claim 74**

Claim 74 is rejected under 35 U.S.C. §102(e) as purportedly being anticipated by Chee *et al.*

(U.S. Patent 6,544,732). Claim 74 reads as follows:

74. A structure, comprising:

*a first structure disposed within a second structure, wherein the first structure has a diameter from about 1 to 20 nanometers,*

*the first structure consisting essentially of a nanospecies having a first characteristic and a second detectable characteristic, wherein the nanospecies is selected from a semiconductor quantum dot, a metal nanoparticle, and a magnetic nanoparticle, and wherein a second detectable energy is produced corresponding to the second detectable characteristic upon exposure to a first energy; and*

*the second structure includes a porous material having the first characteristic and a plurality of pores, wherein the first characteristic of the nanospecies and the first characteristic of the porous material are the same, wherein the interaction of the first characteristic of the nanospecies with the first characteristic of the porous material cause the nanospecies to interact with the porous material and become disposed in the pores of the porous material, and wherein the first characteristic is selected from a hydrophobic characteristic, a hydrophilic characteristic, and an electrostatic characteristic.*

(Emphasis added). Applicants traverse the rejection noted above and submit that the rejection of claim 74 under 35 U.S.C. §102 (e) in view of Chee, should be withdrawn for at least the reason that Chee does not disclose, teach, or suggest the highlighted portions in claim 74 above. It should be also noted that the rejection in the Advisory Action did not deal with claim 74, but appears to be directed to claim 1. Nevertheless, for the sake of expediting prosecution, Applicants make their arguments as though the rejection were directed to claim 74.

Chee does not teach that “the first structure has a diameter from about 1 to 20 nanometers” as recited in claim 74. Chee teaches microstructures that are greater than 100 nanometers, which is in contrast to the first structure presented in claim 74.



In addition, the Advisory Action states that “the microspheres and the nanocrystals [of Chee] are the same entity”. Claim 74 recites “the first structure consisting essentially of a nanospecies... wherein the nanospecies is selected from a semiconductor quantum dot, a metal nanoparticle, and a magnetic nanoparticle....” Thus, according to the definition given in the Advisory Action, the microsphere and nanocrystal “entity” of Chee is different from the nanospecies in claim 74. The “entity” of Chee is not a first structure of claim 74 that consists essentially of a nanospecies, where the nanospecies is selected from a semiconductor quantum dot, a metal nanoparticle, and a magnetic nanoparticle.

Further, the first structure of claim 74 includes a nanospecies that has a first characteristic and a second detectable characteristic. The Advisory Action states that the microsphere and nanocrystal “collectively comprise the first and second characteristics....” As such, the microsphere as used in the Advisory Action is a necessary component of the rejection since it includes the first characteristic. As argued above, the first structure of claim 74 has a diameter from about 1 to 20 nanometers, while Chee teaches a microsphere that has a diameter greater than 100 nanometers. In addition, claim 74 excludes the microsphere as it pertains to the first structure using the language: “first structure consisting essentially of a nanospecies....” Therefore, the microsphere and nanocrystal “entity” as defined in the Advisory Action is not analogous to the first structure of claim 74 and therefore, cannot be properly used to anticipate the first structure of claim 74. The entity of Chee does not meet the features recited in claim 74.

Thus, Chee does not disclose, teach, or suggest, at least the features highlighted above in claim 74. Applicants respectfully request that the rejection to claim 74 should be withdrawn.



**Claims 75-96**

Applicants respectfully submit that pending dependent claims 75-96 include every feature of independent claim 74 and that Chee fails to disclose, teach, or suggest at least the features of claim 74 highlighted hereinabove. Thus, pending dependent claims 75-96 are also allowable over the prior art of record.

**Claim 59**

Claim 59 is rejected under 35 U.S.C. §103(a) as purportedly being anticipated by Chee in view of Girot *et al.* (U.S. Patent 5,268,097). Claim 59 reads as follows:

59. A structure, comprising:

***a first structure disposed within a second structure,***

***wherein the first structure consists essentially of a hydrophobic coated semiconductor quantum dot,*** wherein the coating includes a hydrophobic compound coated on the semiconductor quantum dot, wherein the hydrophobic coated semiconductor quantum dot has a second detectable characteristic, and wherein a second detectable energy is produced corresponding to the second detectable characteristic upon exposure to a first energy; and

***wherein the second structure includes a silica material having a hydrocarbon-derivatized surface*** and having a plurality of pores, wherein the surface of the silica material is hydrophobic, wherein the hydrophobicity of the hydrophobic coated semiconductor quantum dot and the hydrophobicity of the silica material cause the hydrophobic coated semiconductor quantum dot to interact with the silica material and become disposed in the pores of the silica material.

(Emphasis Added) Applicants traverse the rejection noted above and submit that the rejection of claim 59 under 35 U.S.C. §103 (a) in view of Chee and Girot, should be withdrawn for at the least the reason that Chee and Girot, individually or in combination, do not disclose, teach, or suggest the highlighted portions in claim 59 above. It should be also noted that the rejection in the Advisory Action did not



deal with claim 59, but appears to be directed to claim 1 while also using references used against claim 59. Nevertheless, for the sake of expediting prosecution, Applicants make their arguments as though the rejection were directed to claim 59.

The Advisory Action states that “the microspheres and the nanocrystals [of Chee] are the same entity”. Claim 59 recites that “the first structure consists essentially of a hydrophobic coated semiconductor quantum dot...” Thus, according to the definition giving in the Advisory Action, the microsphere and nanocrystal “entity” of Chee is excluded from claim 59 as it pertains to the first structure since the first structure of claim 59 consists essentially of a hydrophobic coated semiconductor quantum dot.

In addition, the first structure of claim 59 includes a hydrophobic coated semiconductor quantum dot that has a second detectable characteristic. The Advisory Action states that microsphere and nanocrystal “collectively comprise the first and second characteristics...”, where the first characteristic appears to be directed to hydrophobicity. As such, the microsphere in Chee and as used in the Advisory Action is a necessary component of the rejection since it includes the hydrophobic characteristic. Claim 59 excludes the microsphere as it pertains to the first structure using the language: “first structure consisting essentially of a hydrophobic coated semiconductor quantum dot ...”. Therefore, the microsphere and nanocrystal “entity” as defined in the Advisory Action is not analogous to the hydrophobic coated semiconductor quantum dot of claim 59 and therefore, cannot be properly used to anticipate or make obvious the hydrophobic coated semiconductor quantum dot of claim 59. The entity of Chee does not meet the features recited in claim 59.



For at least these reasons Applicants assert that combining Chen with Girot is improper and the Office Action has not established the *prima facie* case of obviousness. Thus, the rejection to claim 59 should be withdrawn.

**Claims 60-73 and 99-101**

Applicants respectfully submit that pending dependent claims 60-73 and 99-101 include every feature of independent claim 59 and that the relevant patents noted above fail to disclose, teach, or suggest at least the features of claim 59 highlighted hereinabove. Thus, pending dependent claims 60-73 and 99-101 are also allowable over the prior art of record.

**Claims 102-110**

Claims 102-110 are newly added and are believed to overcome the cited references. In particular, claim 102 recites:

102. A structure, comprising:  
*a first structure disposed within a second structure,*  
*wherein the first structure consisting of a hydrophobic coated semiconductor quantum dot,* wherein the coating includes a hydrophobic compound coated on the semiconductor quantum dot, *wherein the hydrophobic coated semiconductor quantum dot has a second detectable characteristic,* and wherein a second detectable energy is produced corresponding to the second detectable characteristic upon exposure to a first energy; and  
*wherein the second structure includes a hydrophobic porous material* having a plurality of pores, wherein the hydrophobicity of the hydrophobic coated semiconductor quantum dot and the hydrophobicity of the hydrophobic porous material cause the hydrophobic coated semiconductor quantum dot to interact with the hydrophobic porous material and become disposed in the pores of the hydrophobic porous material.



(Emphasis added) Applicants submit that the references cited thus far do not teach, suggest, or disclose, individually or in combination, at least the highlighted portions of claim 102. Therefore, claim 102 and its dependent claims 103-110 should be allowed.

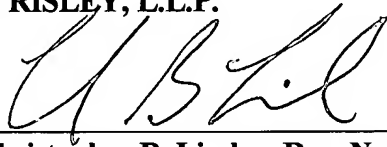
**CONCLUSION**

Applicants respectfully request that this application and all presently pending claims be allowed to issue. If the Examiner has any questions or comments regarding Applicants' response, the Examiner is encouraged to telephone Applicants' undersigned counsel.

Respectfully submitted ,

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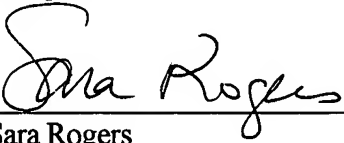


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on April 19, 2005.

  
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Sara Rogers

In Re Application of: Nie, et al.

Group Art Unit: 1641

Serial No.: 10/666,587

Examiner: Melanie J. Yu

Filed: September 18, 2003

Docket No.: 50508-1100

**For: POROUS MATERIALS EMBEDDED WITH NANOSPECIES, METHODS OF FABRICATION  
THEREOF, AND METHODS OF USE THEREOF**

The following is a list of documents enclosed:

Return Postcard  
Request for Continued Examination (RCE) Transmittal  
Response  
Petition for One Month Extension of Time  
Credit Card Payment Form in the amount of \$455.00

Further, the Commissioner is authorized to charge Deposit Account No. 20-0778 for any additional fees required. The Commissioner is requested to credit any excess fee paid to Deposit Account No. 20-0778.